A Brilliant Theatre

After Crystal Search

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Kandidatarbete 2025

The project began with experiments involving different volumes and eventually resulted in two forms that were woven together into a cohesive whole. At times, it was challenging to find the connection between a seashell and a diamond—two seemingly unrelated shapes—but what lies beneath the surface of the ground revealed itself to be the common thread that unites them. Through this discovery, a deeper understanding emerged, giving the project a more profound meaning.

The entire process has been both new and inspiring, filled with playfulness, exploration, and learning. I explored a variety of techniques and expressions, but what truly captured my fascination was working with charcoal drawings. There was something almost magical about seeing forms emerge from the darkness of the paper, and this became a recurring element in my work. I created numerous charcoal drawings in various formats, which helped further develop my artistic expression.

In the end, we succeeded in merging the two initial volumes into an architectural entity that invites a sensory experience, a movement inward, where form, concept, and emotion converge.

VIEW FROM OUTSIDE THE ENTRANCE

Site
The building sits on a slope, with the main entrance placed on the higher ground and the backstage functions placed on the bottom. This places part of the theater hall and rehearsal hall below ground, which greatly reduces the amount of noise that reaches in from the busy urban environment outside. It also allows the underground lobby a gentler inclination than would have been possible had the building been placed on flat ground.

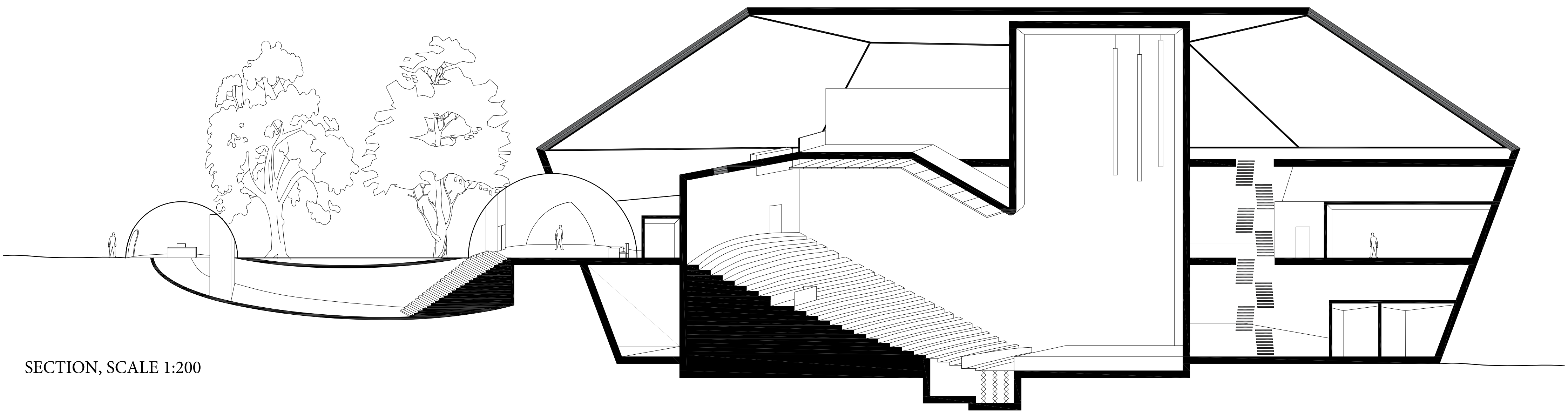
Lobby
The entrance consists of a glass dome, seemingly separate from the diamond-shaped main building volume. From there, visitors are led underground, by either stairs or elevator. As they descend, visitors enter a broader underground space. It is like an artificial cave, making the lobby an experience in itself. Floor, walls and ceiling are made of concrete that has been cast in place, giving the space a raw and solid feel. The walls and ceiling are intentionally uneven, but otherwise untreated, creating a cave-like atmosphere, both visually and acoustically. Crystalline shapes protrude from the surfaces, enhancing the cave-like experience.

A grand staircase leads up to a second dome. The staircase gradually widens as it ascends, inviting movement upward. There are also elevators, for the sake of accessibility. Back above ground, the lobby branches into two glass corridors leading into the main building volume. Visitors choose the corridor depending on which theater hall entrance they are headed to, or if they are headed to the rehearsal hall. The domes and above-ground corridors are made of glass, giving lightness, transparency, and spaciousness to the lobby.

Theater hall
The theater hall is relatively narrow, allowing all visitors a good view of the stage. Visitors enter the hall from the back and descend the stairs as they move toward the stage. The stairs are placed four seats in from the side walls.

The ceiling of the theater hall is covered in stone, giving the impression that the hall has been hewn directly from the bedrock, and the walls are lined with wooden pillars. The pillars still have bark on them, as if someone has taken trees directly from outside and put them there to hold up the heavy stone ceiling. There are five glass-concrete windows at the back of the ceiling, which let daylight into the theater hall, beautifully diffused by the glass-concrete.

Courtyard
Since the diamond-shaped volume of the building leaves us with a lot of unused space, we have placed a courtyard with a glass roof on the floor above the theater hall. This provides the building with a vast recreational space that is both light and airy. A low wall keeps people from walking onto the back part of the theater hall ceiling.



SECTION, SCALE 1:200

Acoustics

The large wooden pillars that the walls are lined with are triangular in cross-section and can be rotated around their own axle independently of each other. One side is covered in bark, allowing it to act as a diffuser. Another is flat and acts as a reflector. The third is perforated, in order to function as an absorber. This makes the acoustic performance of the hall variable, allowing for an optimal acoustic environment for different use-cases.

Another feature that makes the acoustic performance variable is the ceiling, which consists of stone plates that can be angled and moved vertically according to the user's needs and wishes. The plates are only covered with a thin layer of stone in order to prevent hazards such as plates cracking, leading to pieces falling off.

The glass concrete in the windows of the theater hall offers excellent sound insulation, which greatly reduces noise in the hall from the lobby and the courtyard.

Noise

Double walls and floating slabs are used for insulation against external noise.

External Noise Control:
- Day: 55–70 dB LAeq
- Night: 45–60 dB LAeq

To reduce sound transmission ro and from the auditorium and rehearsal room, the spaces use room-in-room construction with floating floors, suspended ceilings, and double walls filled with mineral wool. These elements are decoupled to reduce both airborne and structure-borne sound. Additional measures include sealed acoustic doors, sound-lock vestibules, and carefully treated junctions to minimize flanking transmission.

VIEW FROM THE LOBBY

MODELS OF VARIABLE ACOUSTIC FEATURES
RIGHT: STONE PLATE
BELOW: WOODEN PILLARS

Legend:
- 1-3. Concert Hall
- 4. Rehearsal hall 182 sqm
- 5. Scene shop 310 sqm
- 7. WC 5,5 sqm (each)
- 8. Chorus dressing room 100 sqm (both rooms)
- 10. Lighting & stage control room 28 sqm
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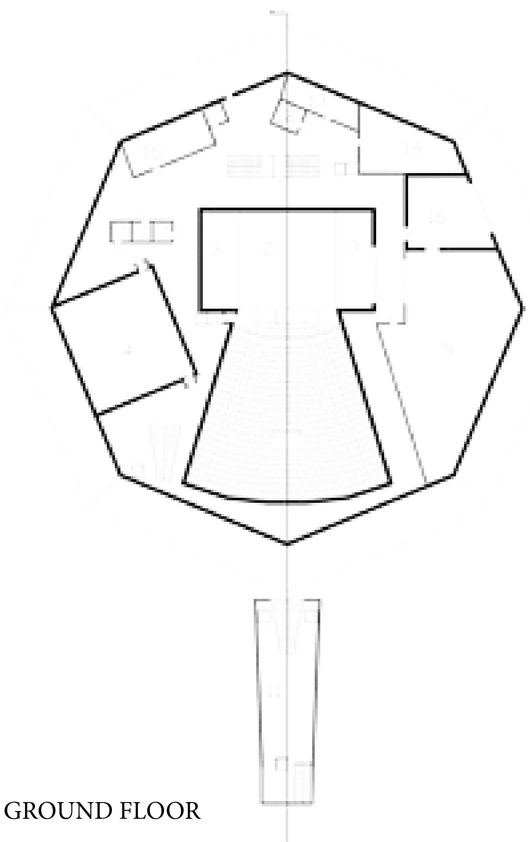
- 18. MEPFIT 380 sqm

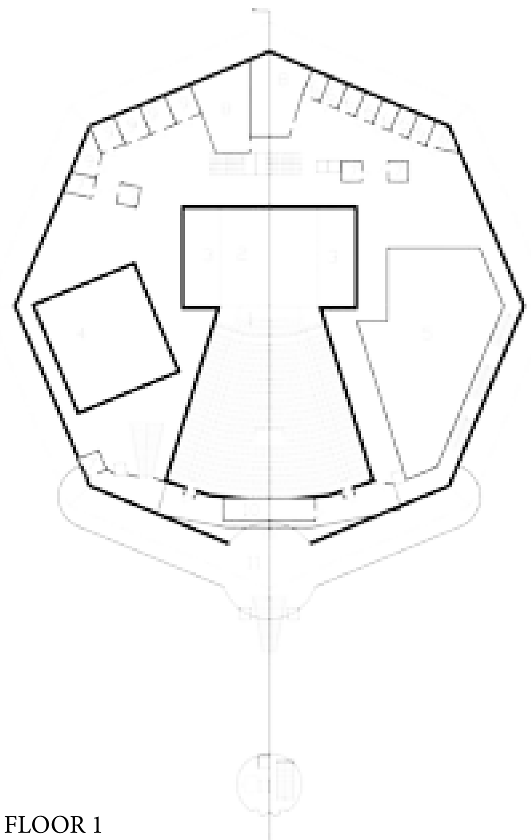
Halls and Corridors

Noise Criteria: dB(A)
- -
- 40 Allows for moderate ambient noise without impacting operations.
- 30 Comfortable background level without compromising communication.
- 15 Quiet environment for unamplified music and performance clarity.

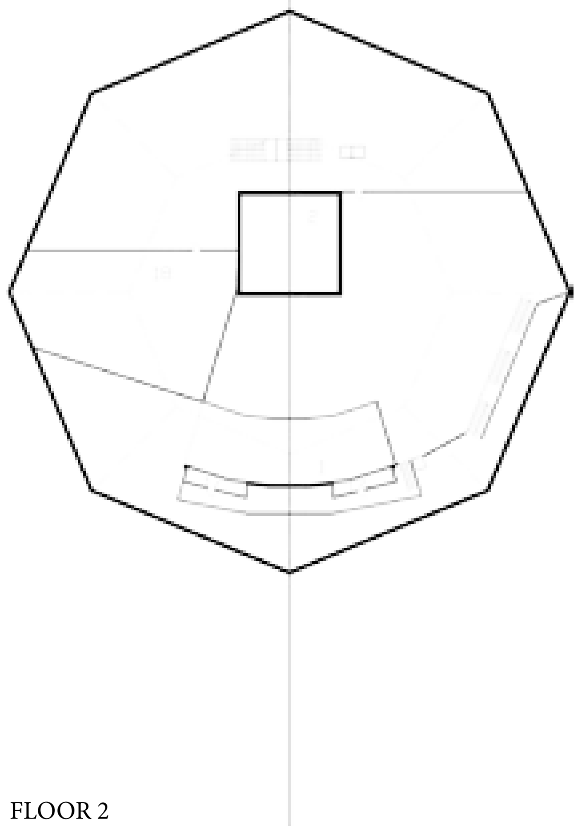
FLOOR PLANS, SCALE 1:500



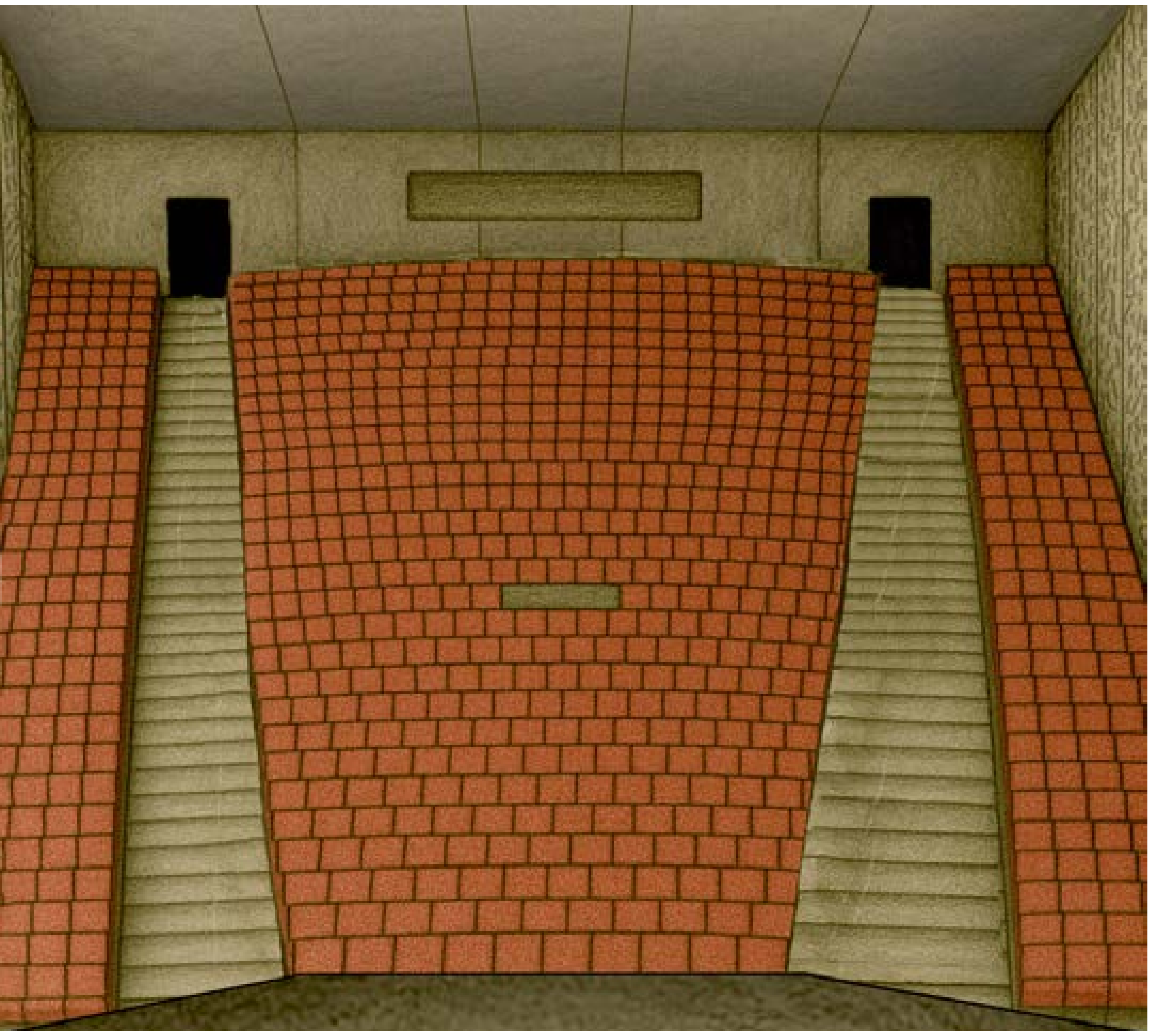
GROUND FLOOR



FLOOR 1



FLOOR 2



VIEW FROM INSIDE THE THEATER HALL

RT60 Simulations

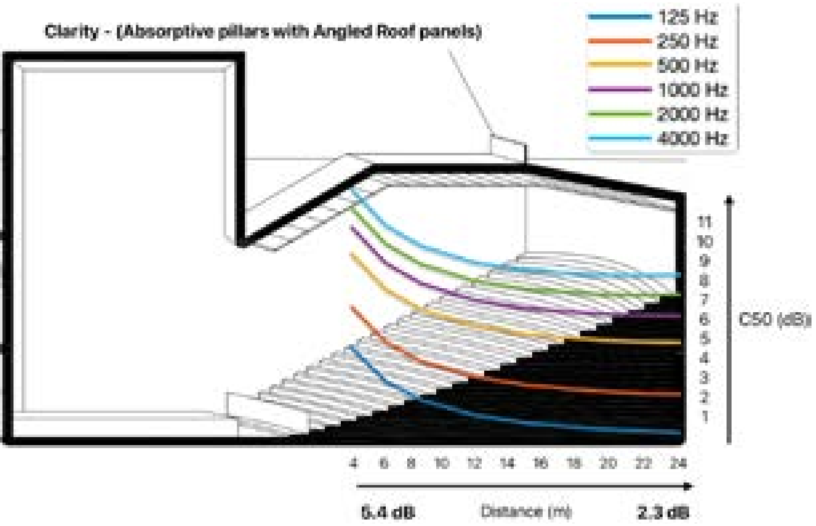
RT60, C50 and G was simulated for 9 configurations (3 wall types × 3 ceiling types) and with the hall being empty and occupied giving highly dynamic values. The current setup uses absorptive walls and an angled ceiling and RT60 falls between 0,7 – 1,2 s. The absorptive side of the wooden pillars are equipped with slit absorbers which allows sound to enter through slits in the surface, behind which there is a cavity filled with mineral wool. The slits create resistance, and the cavity provides damping, making the system absorb low to mid-frequency sound energy. The width and cavity depth of the slit is designed to target frequency ranges between 125–500 Hz. This makes them ideal for compact, surface-mounted acoustic control on the pillars.

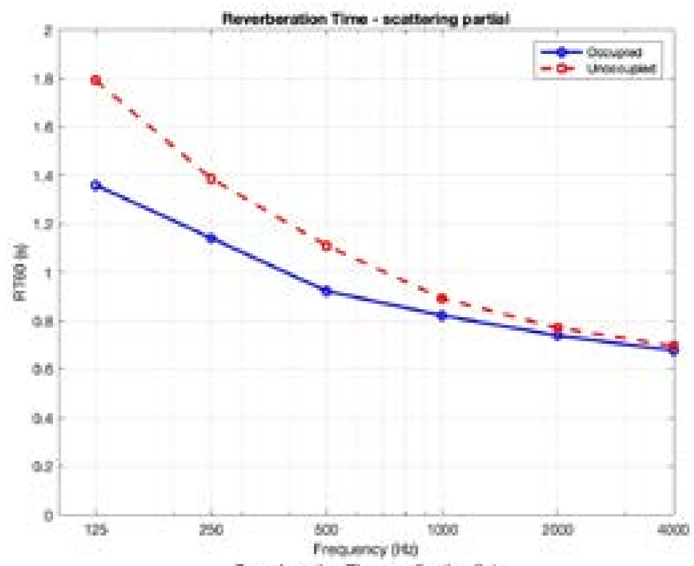
Early Reflections

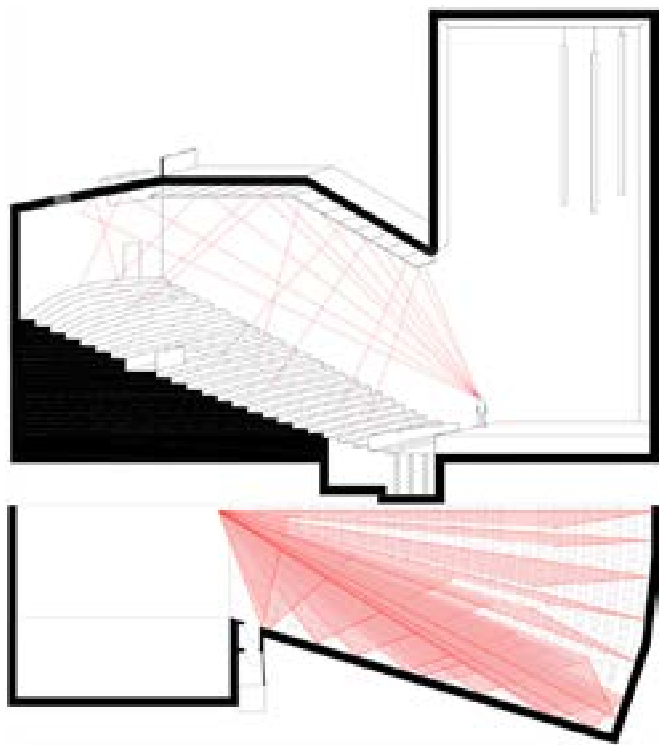
Early reflections arriving 20 to 80 milliseconds after the direct sound enhance clarity, presence, and speech intelligibility. In this theatre, they are directed toward the audience using angled ceiling panels and reflective wall surfaces. Their effect can be tuned by rotating the wooden pillars and adjusting the tilt of the stone panels allowing the acoustic response to be tailored for different types of performances. In addition, loudspeakers placed throughout the hall use electronic delay to ensure that reinforced sound arrives just after the direct sound, preserving natural directionality and preventing reflections from arriving too early.

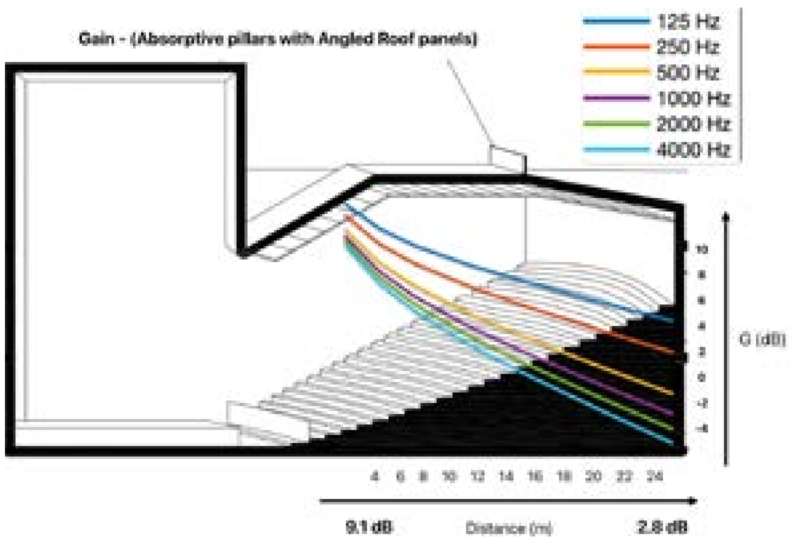
Acoustic Performance Targets

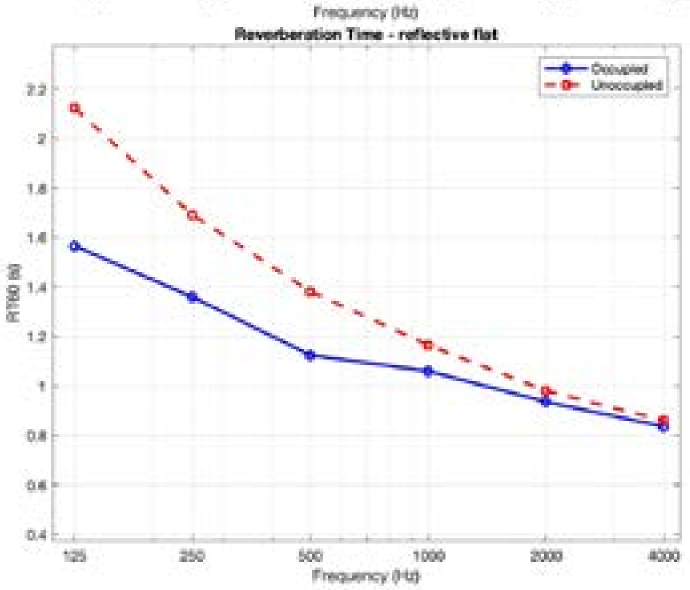
Parameter	Target Range	Purpose
RT60	0.7–1.2 s	Speech/music balance
G	+3 to +8 dB	Strength and presence
C50	+3 to +6 dB	Intelligibility
C80	-3 to +3 dB	Music clarity

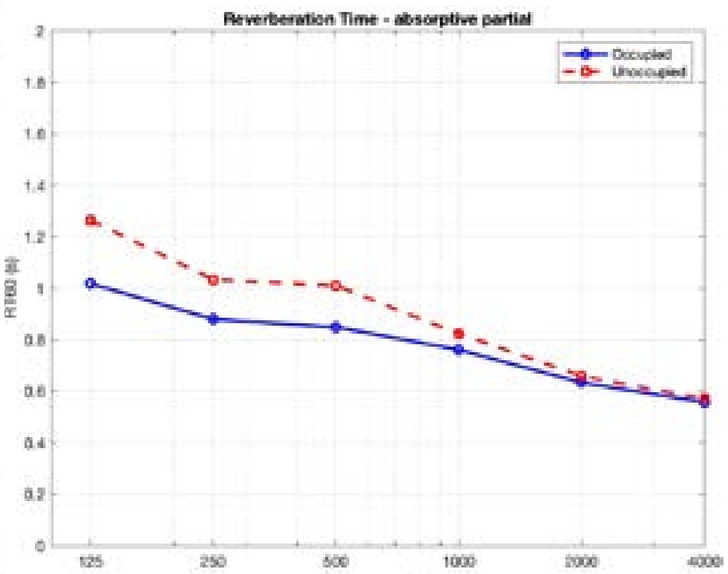




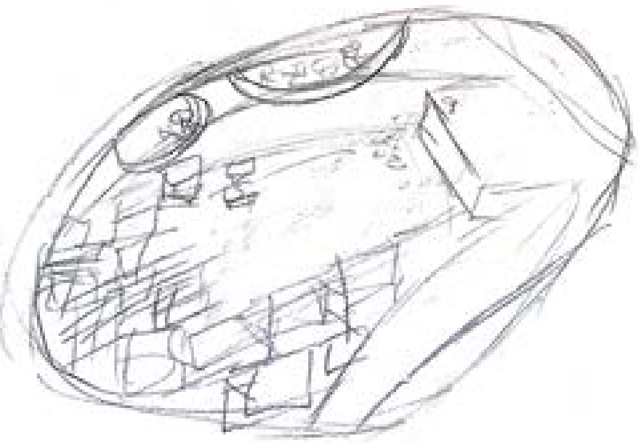


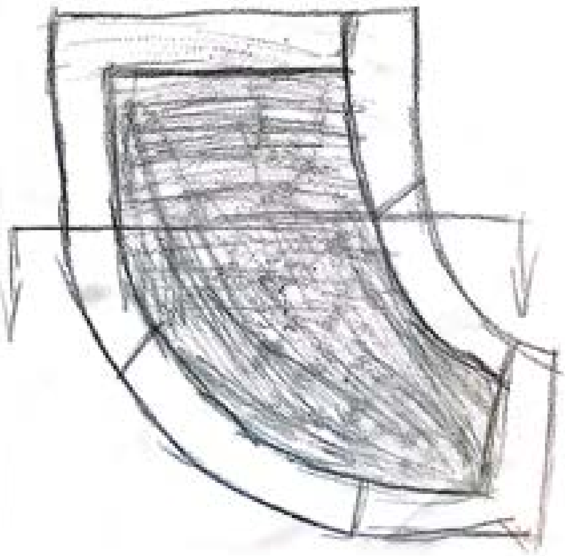


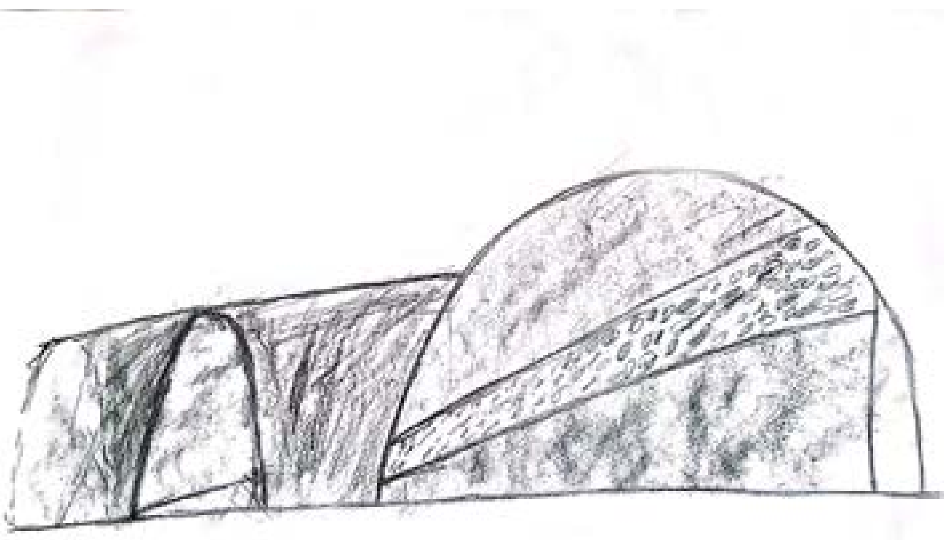


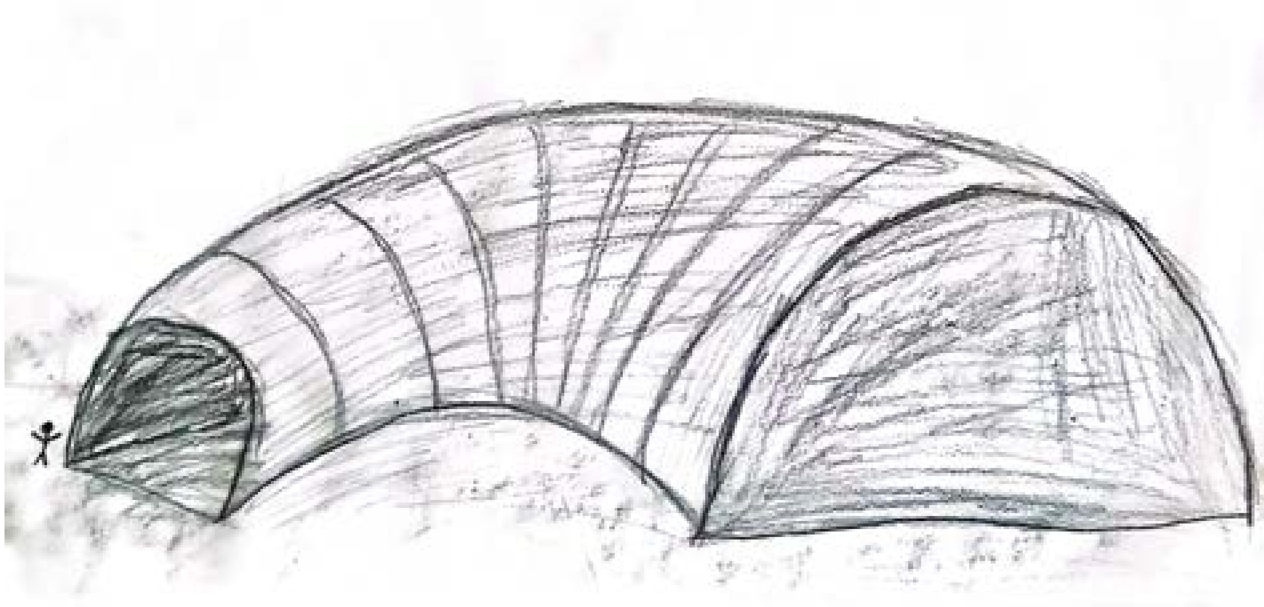


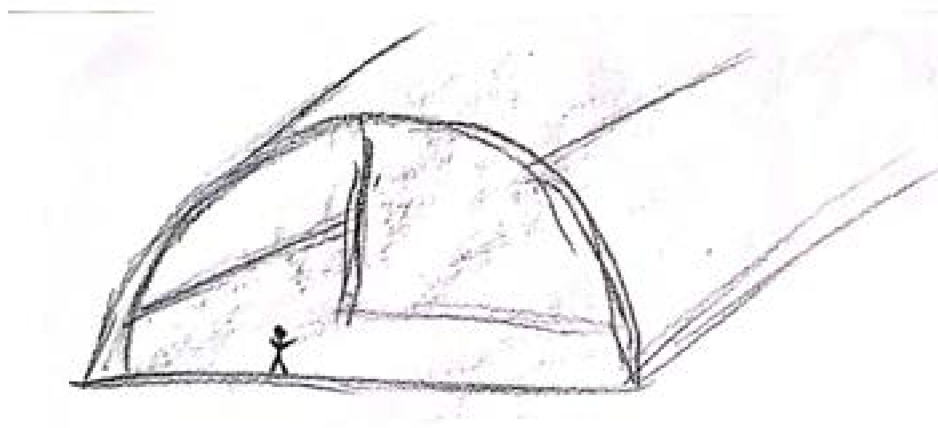
The shell











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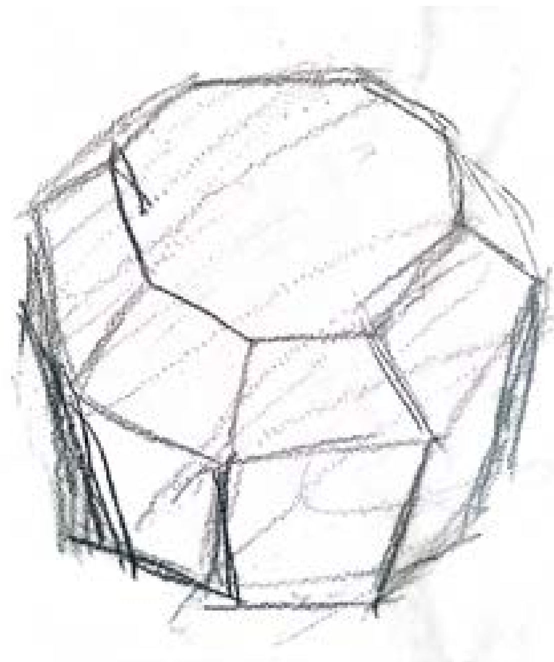
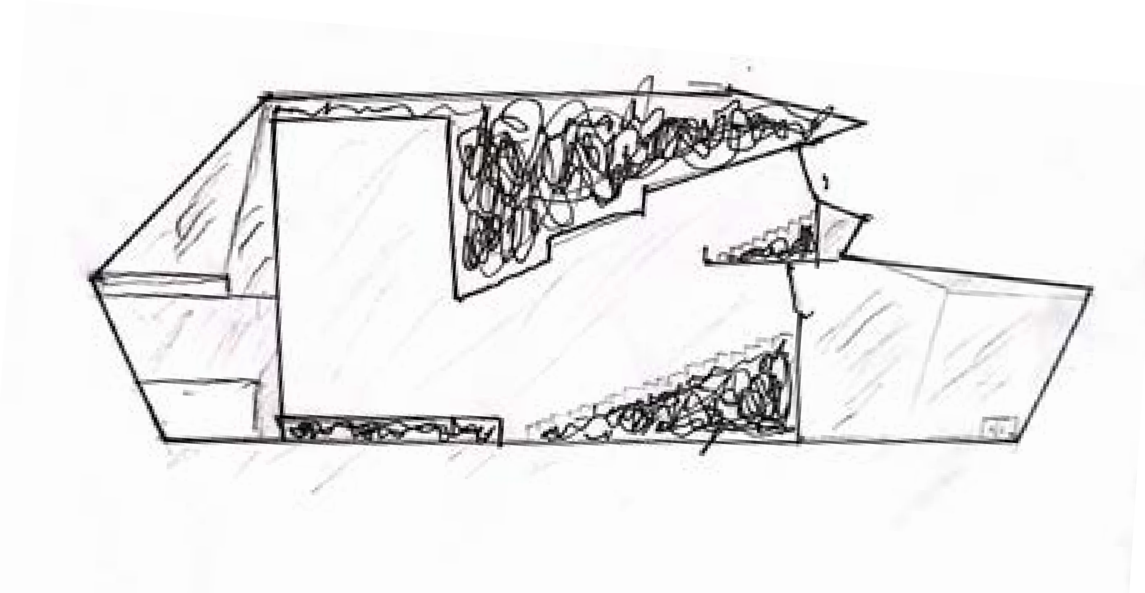
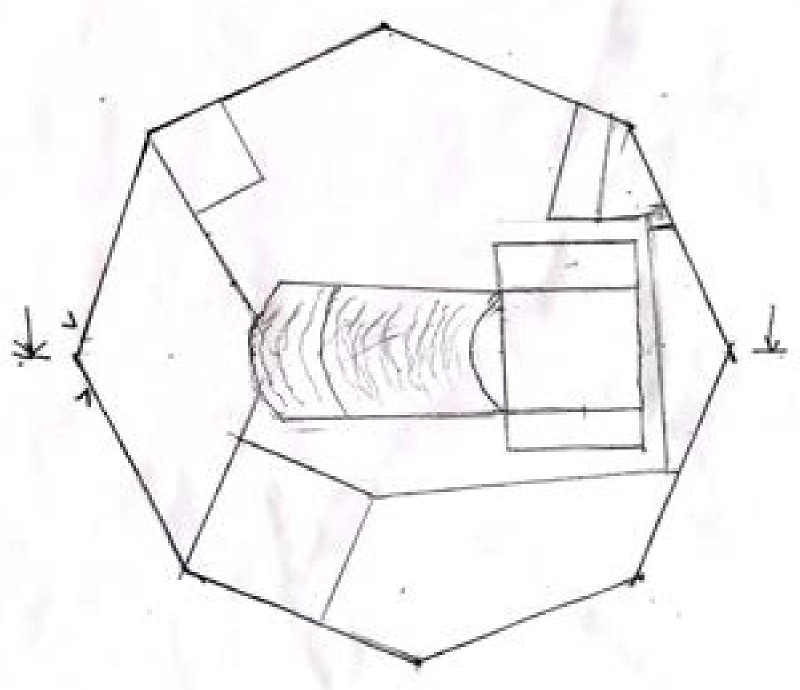
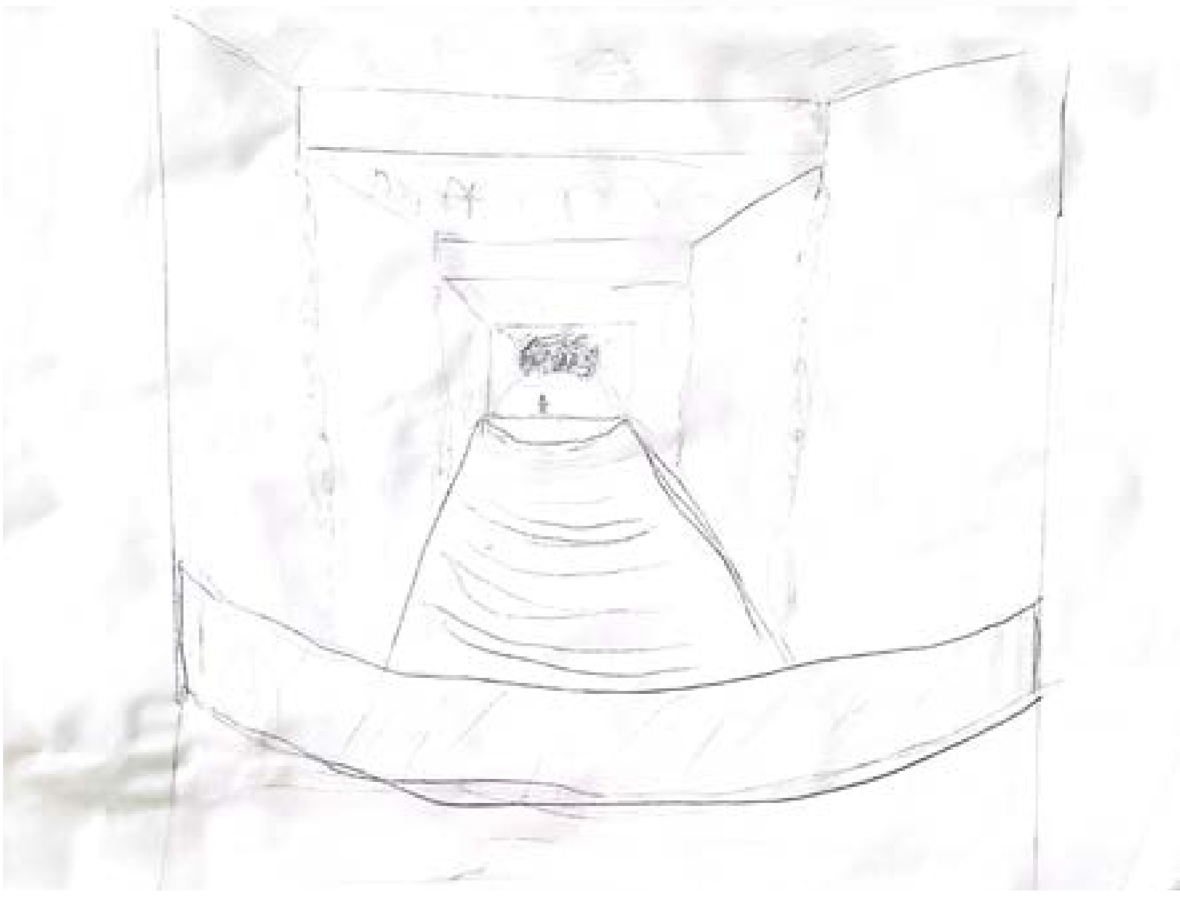
The diamond









The acoustic prototypes

To enhance the acoustics within the theater hall, three conceptual prototypes were developed, each designed to serve a distinct function. Working with these prototypes has been both creative and rewarding. The process involved exploring how each one affected the acoustic qualities of the space, while also constructing physical models and producing architectural drawings as part of the hands-on investigation.........

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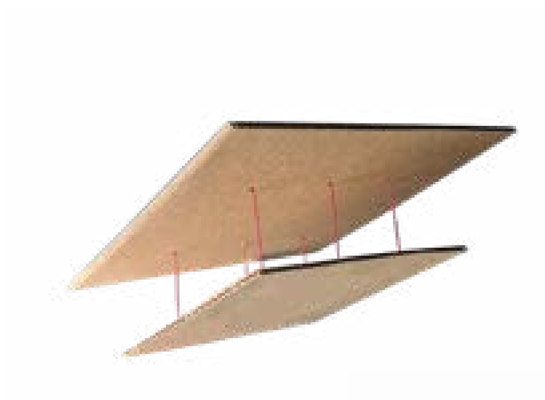
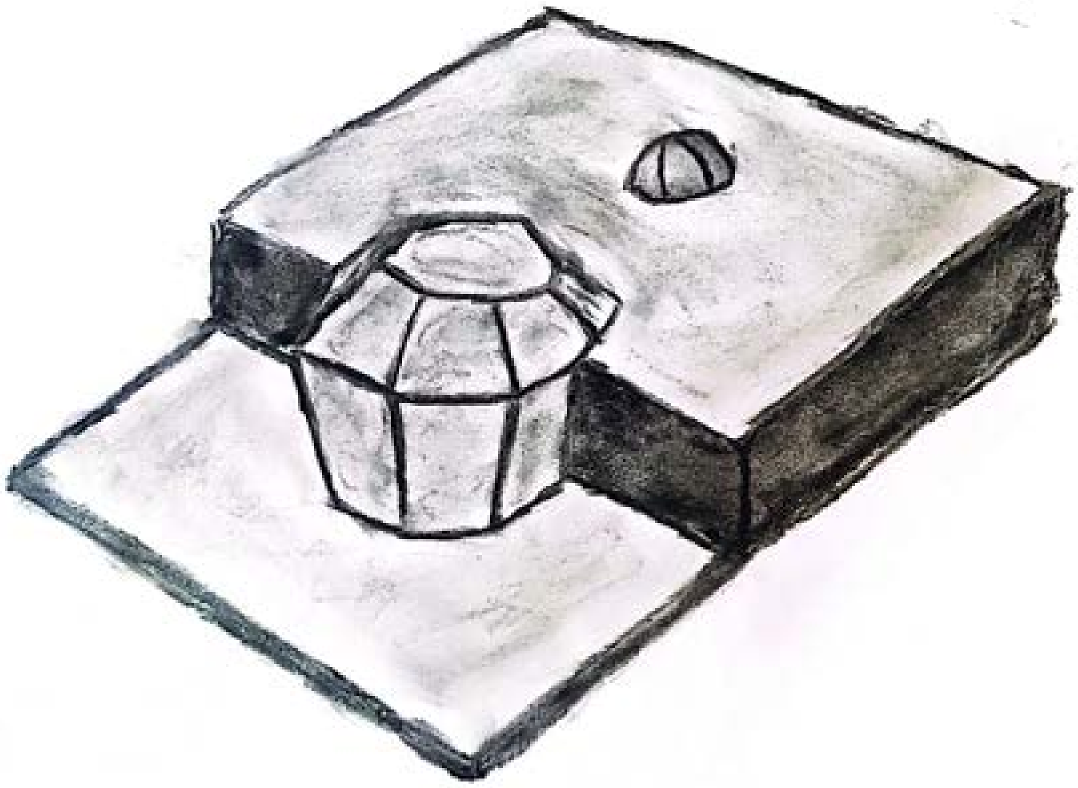
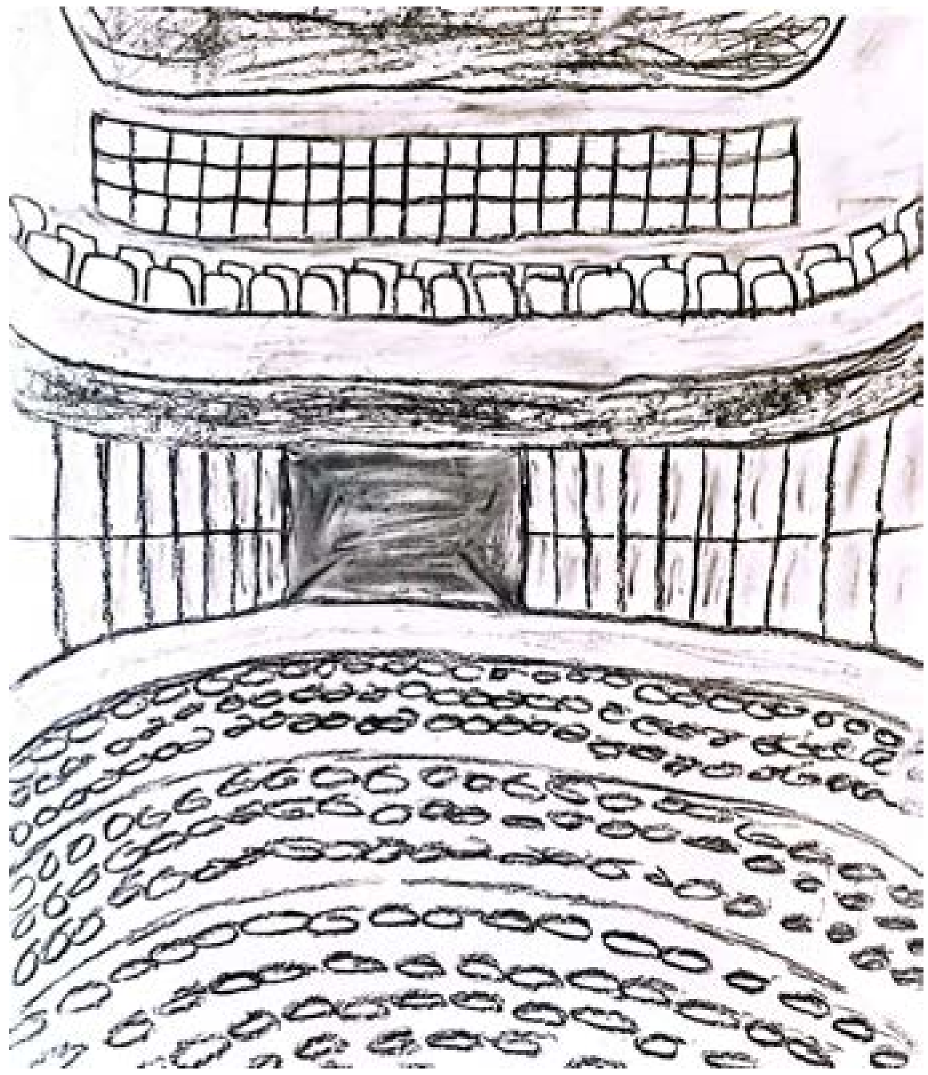


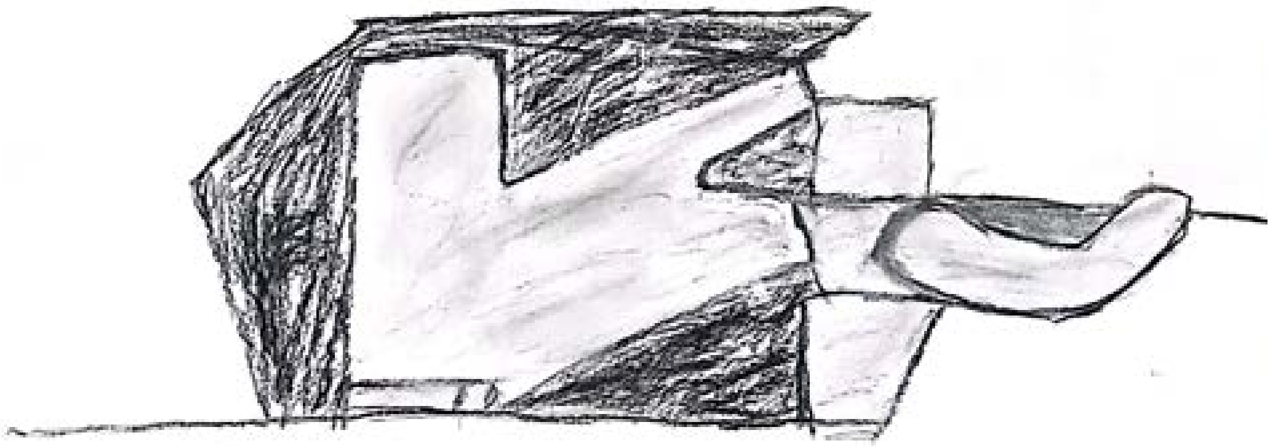
The glass concrete in the windows of the theater hall offers excellent sound insulation, which greatly reduces noise in the hall from the lobby and the courtyard.

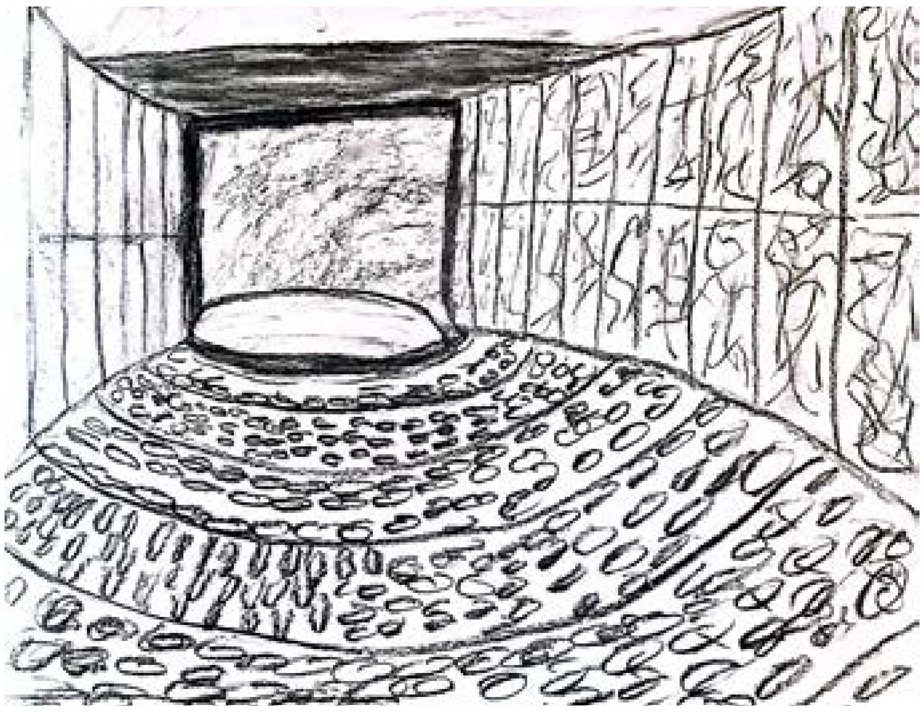
Since glass concrete is stronger than just ordinary glass, our windows contribute to the structural integrity of the building.

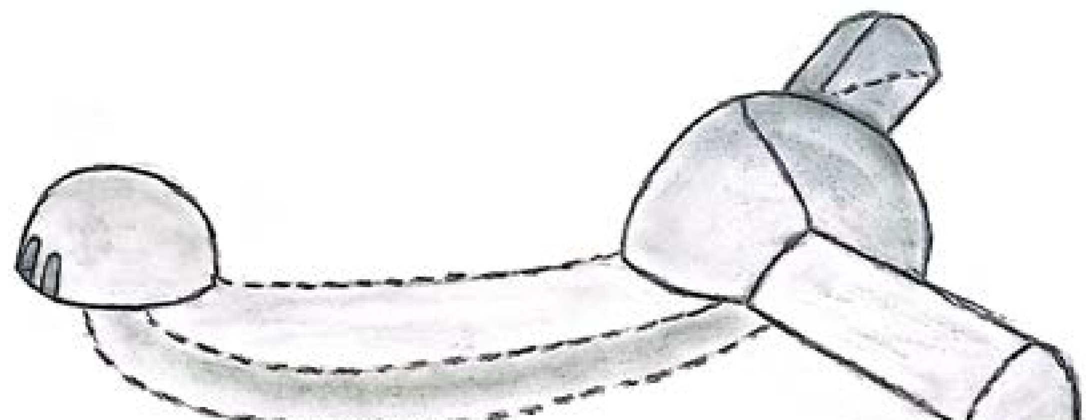
Charcoal drawings

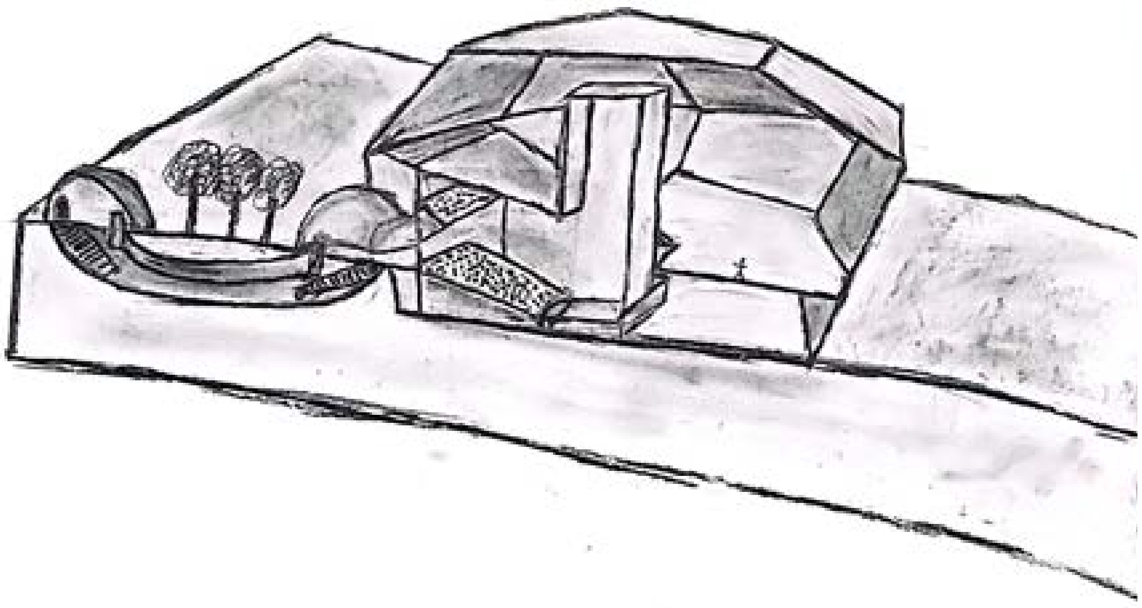


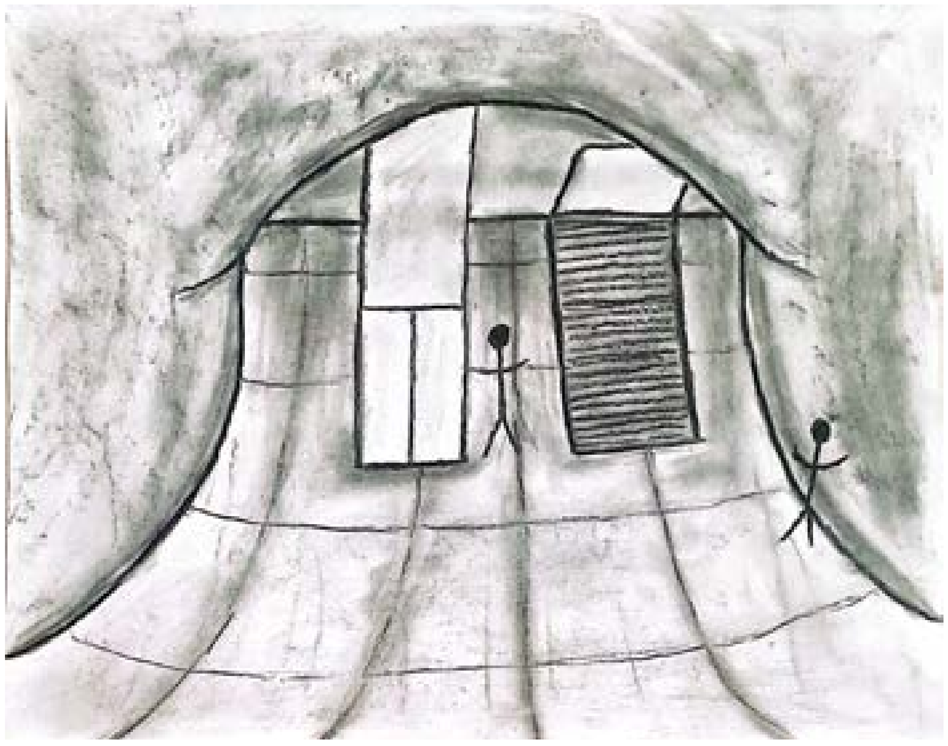


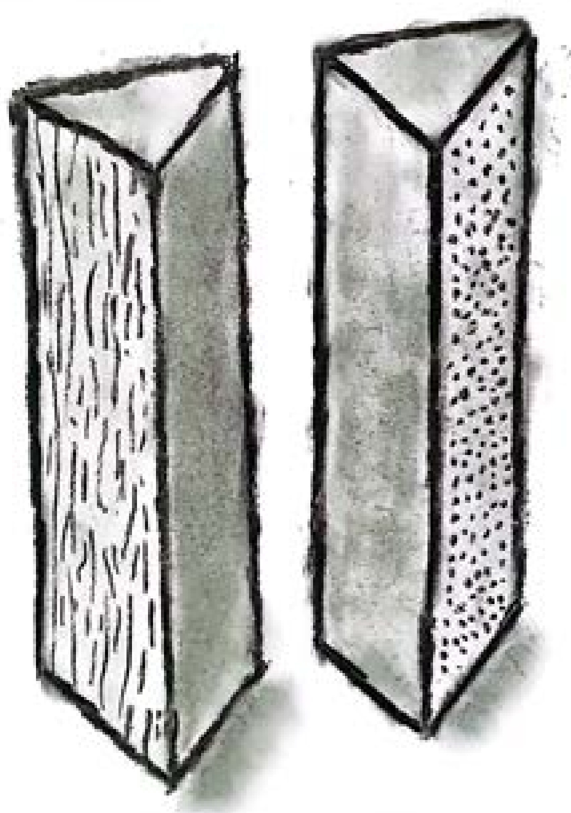


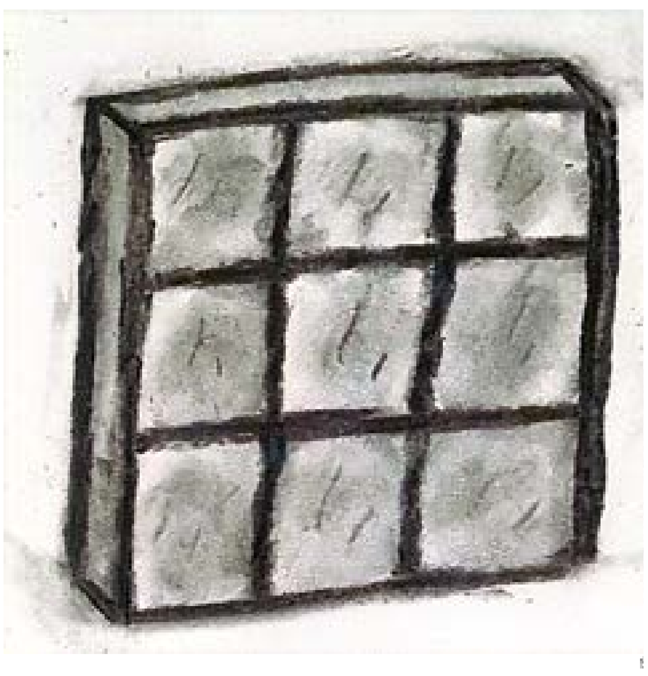


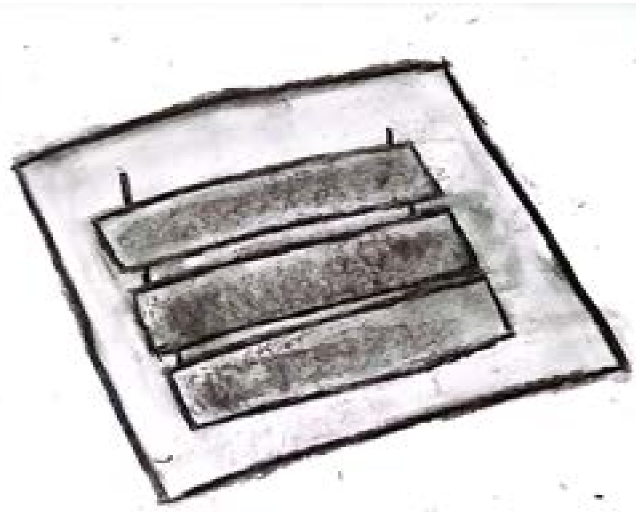








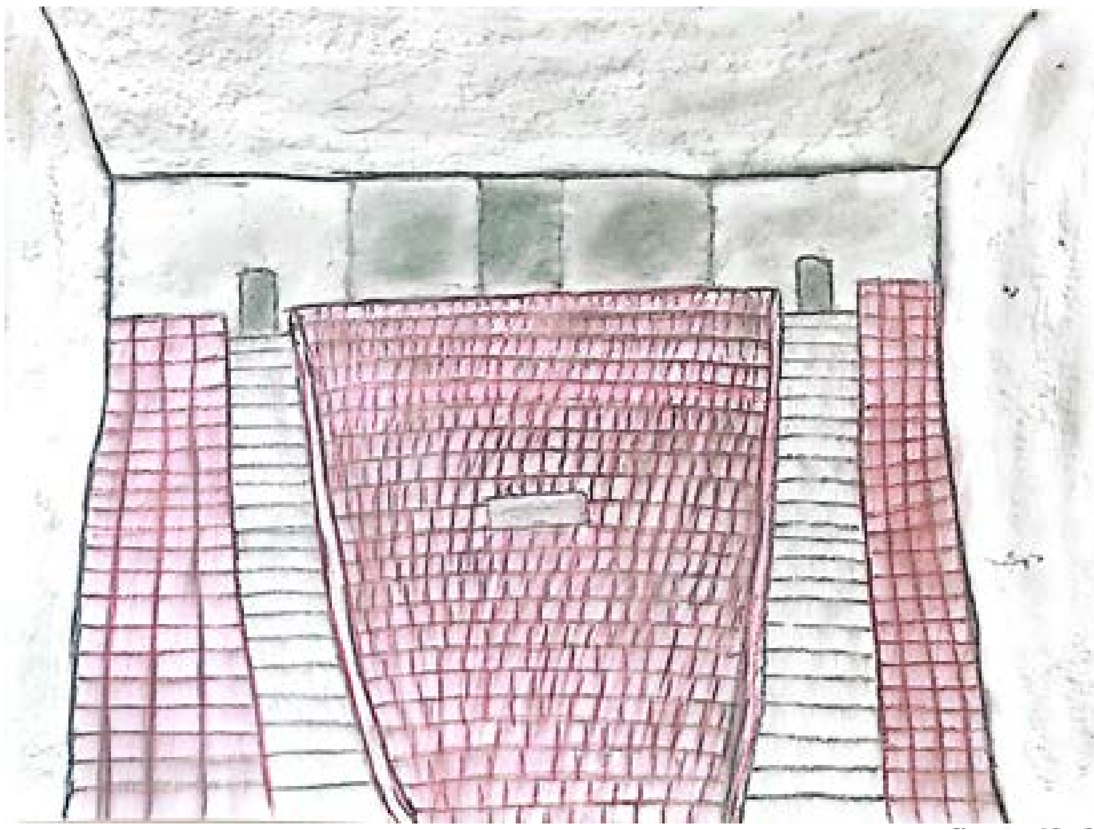




Charcoal drawings with colors!

Another enjoyable aspect of the process was experimenting with color in the charcoal drawings by incorporating pastels. This added a new dimension and brought the drawings to life.

The use of color helped to emphasize certain elements and emotions, enhancing the clarity and impact of the visual narrative.



The result

The result reflects a carefully considered architectural design where aesthetics and acoustics work in harmony. Together, they have contributed to the creation of a building that offers not only a compelling spatial experience but also performs effectively from an acoustic standpoint, a balanced synthesis where form and function meet.

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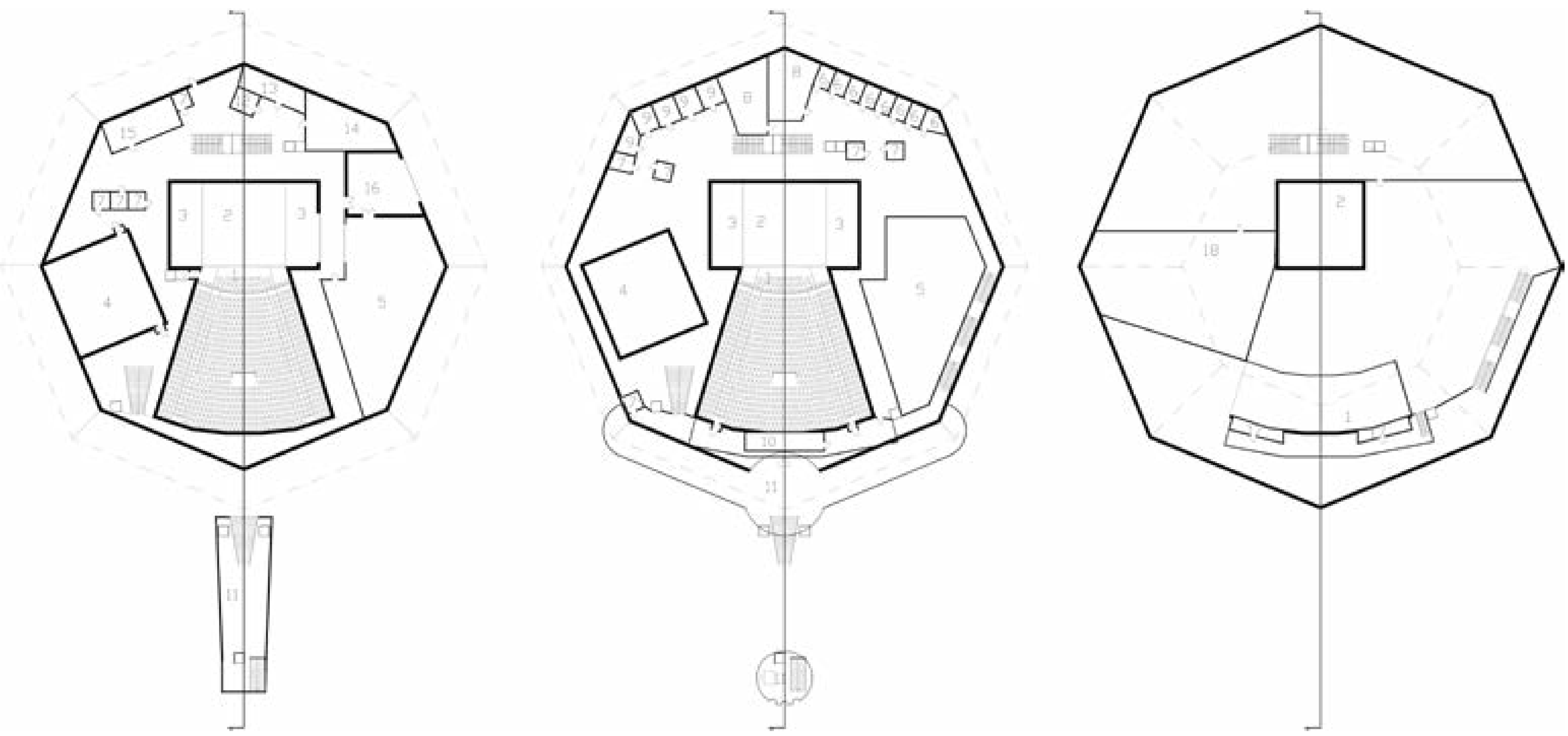

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Halls and Corridors

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dB(A)

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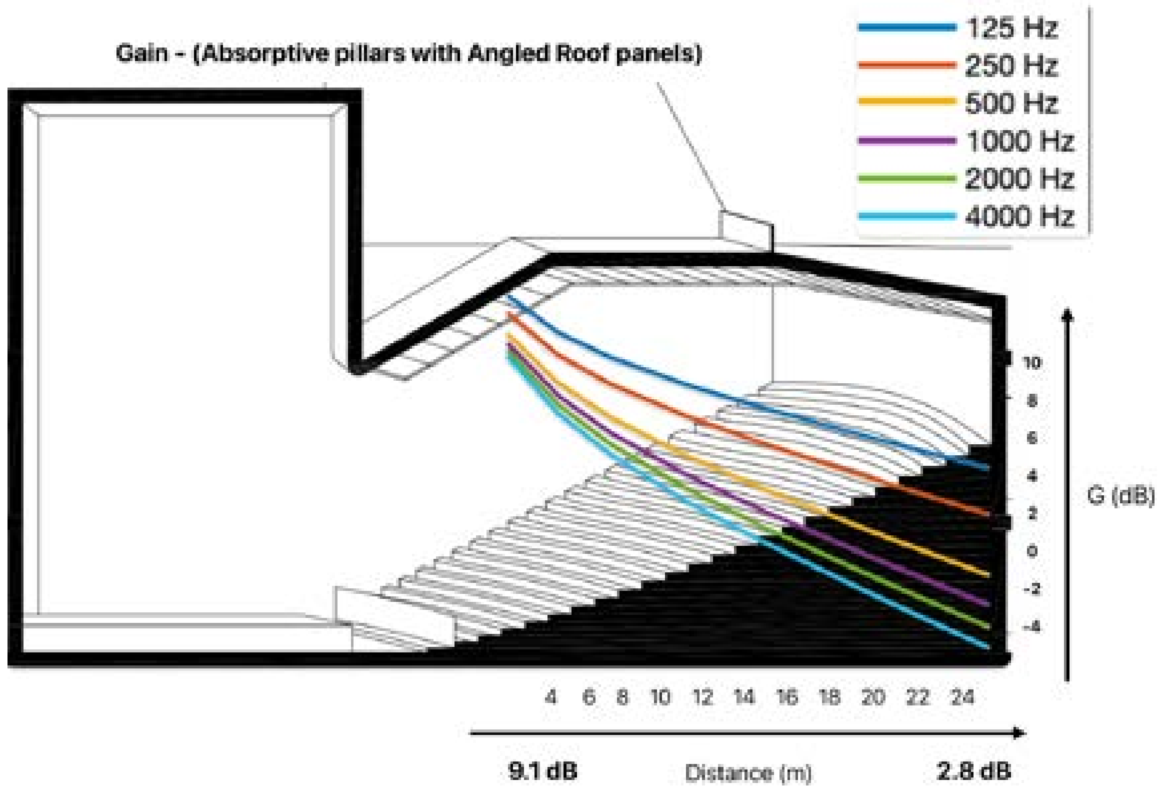

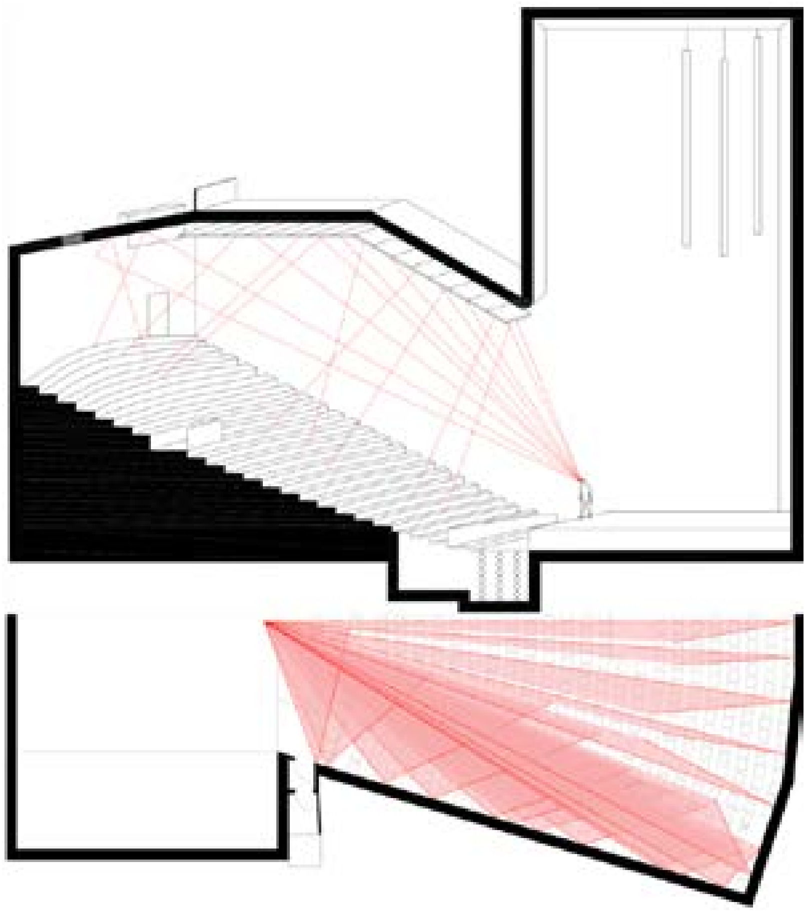

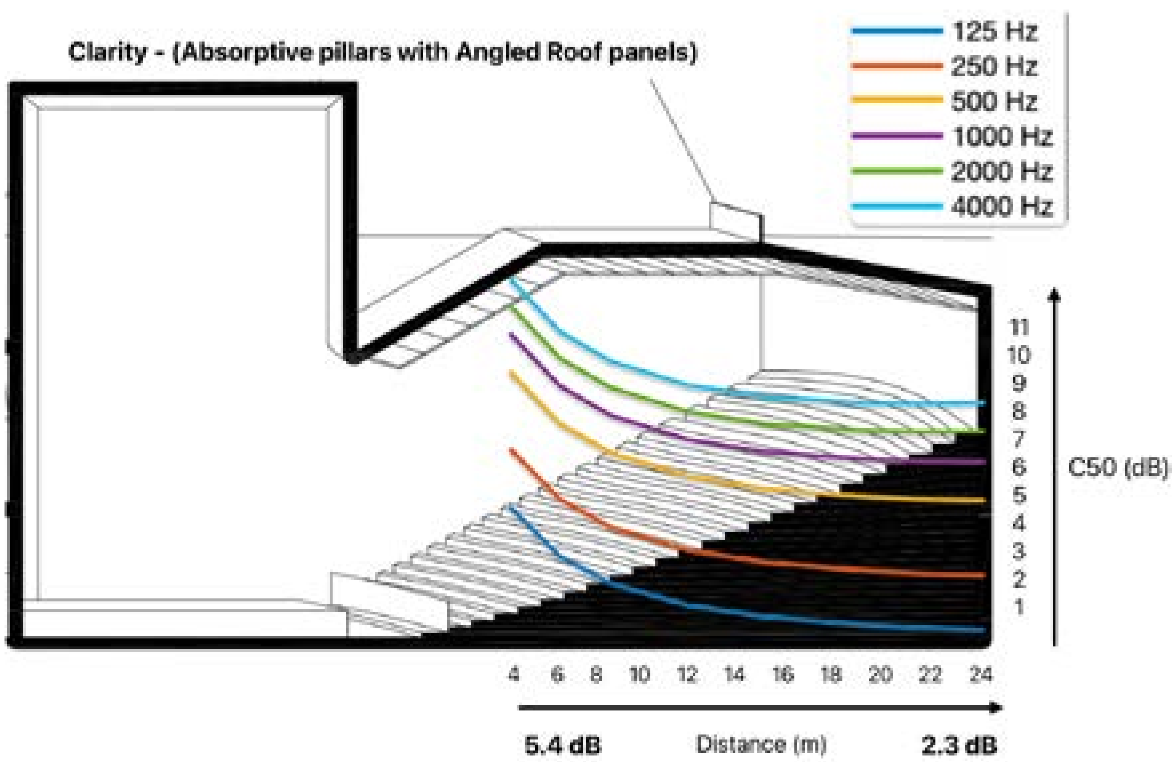

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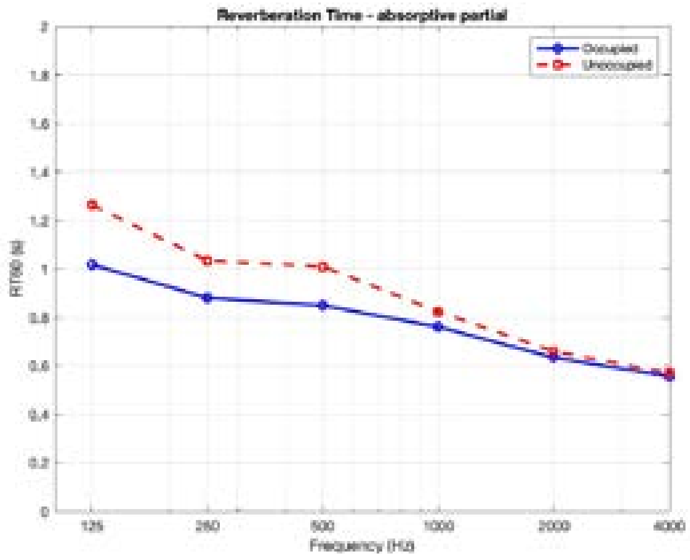

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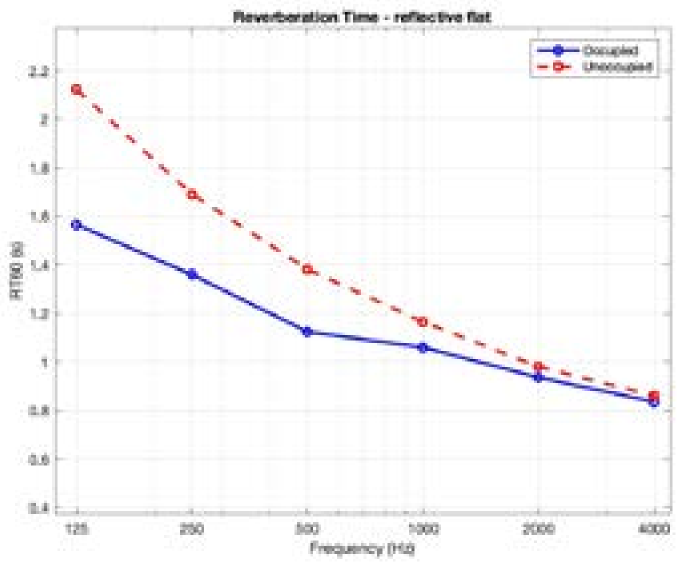

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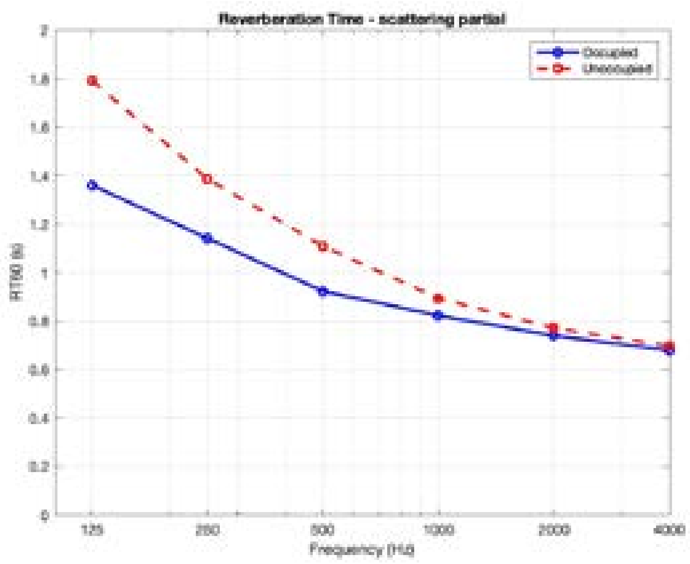

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